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Incorporating the geography of climate change into conservation planning for the California Landscape Conservation Cooperative

Project update

This CA LCC project began in mid August by acquiring hardware and GCM data. I have been accumulating additional datasets and methods to describe ecologically relevant climate conditions. One such dataset is climatic water deficit, which in my preliminary analyses has been the single best predictor explaining vegetation type diversity in the Bay Area (figures 1 & 2). I have started adapting methods from Loarie et al. (2009) into scripts for use with the downscaled climate data from the Flints (USGS) and Climate Central. These methods will hopefully be included in a collaborative effort led by Climate Central to host data and analyses on the NASA Earth Exchange (proposal pending at NASA). I continue to collaborate and be involved with the Bay Area Climate Workgroup as a way to get feedback and ensure efforts are not duplicated.

My next major task (#4 below) will begin to quantify vulnerability by analyzing change with reference to baseline or historic conditions. For example, a two degree change in temperature near the coast (where there is low variation) may be just as ecologically relevant as a ten degree change in the desert where there is larger variation. Similarly, an increase in climatic water deficit, a good measure of drought stress, can occur even without a change in precipitation if temperature increases.

I still foresee meeting the stated deliverables and would only push back timelines by a month or two.

The project's original task list (italicized have not begun):

1. Acquire downscaled data and historical products to establish baseline conditions
2. Generate ecologically relevant climate-related data (more than temp & precip)
3. Generate scripts to analyze climate data and compute rates of change
4. Assess climate conditions and vulnerability of PAs within as subset of the CA LCC
5. Prepare report (OFR) on the methodology and results of PA subset, send out for review, incorporate comments into methodology
6. Assess climate conditions and vulnerability for entire CA LCC
7. Priority analysis of corridors within the CEHC, report, journal paper
8. Design of future research projects capitalizing on this data

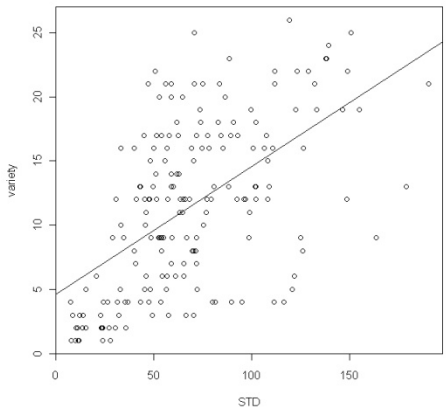

Figure 1: The variety of vegetation types within a 12km grid vs the standard deviation of climatic water deficit ($p<0.0001$, $r^2 = 0.31$)

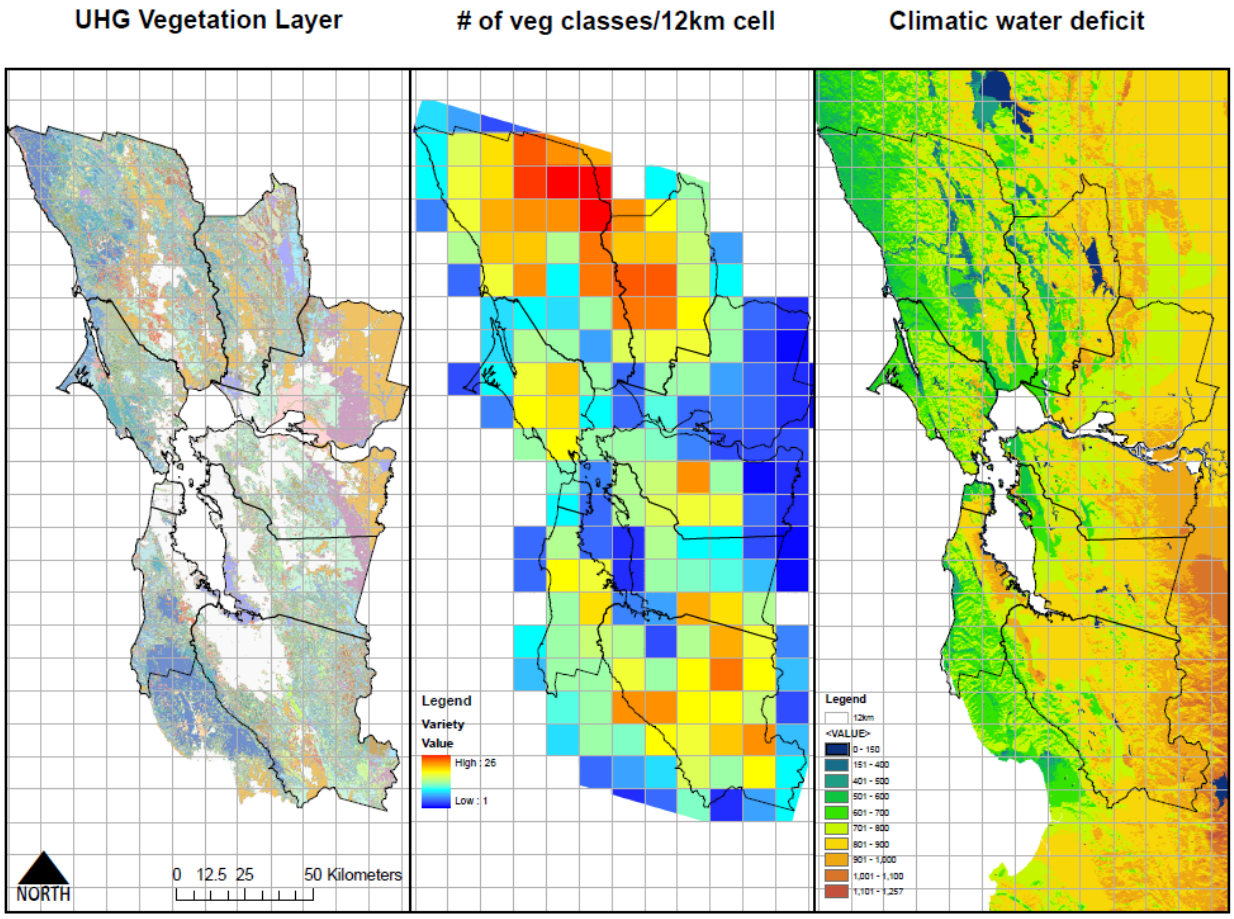

Figure 2: Bay Area analysis of vegetation type diversity and CWD